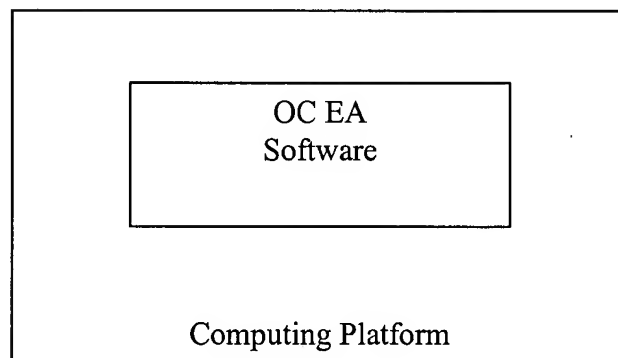


**Figure 1**



**Figure 3**

```

      SUBROUTINE NONLINEAR_FX( INDVAR, FX, JAC, HES )
      USE PROBLEM_DATA
      USE EB_HANDLING
      IMPLICIT NONE
      ! ARGUMENT LIST VARIABLES
      REAL(KIND=8),      DIMENSION(NV), INTENT(IN )::INDVAR
      REAL(KIND=8),      DIMENSION(NF), INTENT(OUT)::FX
      REAL(KIND=8),      DIMENSION(NF,NF), INTENT(OUT)::JAC
      REAL(KIND=8), DIMENSION(NF,NF,NF), INTENT(OUT)::HES
      ! DEFINE LOCAL EMBEDDED VARIABLES
      TYPE(EB), DIMENSION(NV)::EB_VAR
      TYPE(EB), DIMENSION(NF)::EB_FCTN
      TYPE(EB)::X,Y,Z,U,W
      INTEGER::I
      ! GENERATE EMBEDDED VERSIONS OF INDEPENDENT VARIABLES
      CALL EB_INITIALIZE_INDEP_VAR( INDVAR, EB_VAR )
      ! ASSIGN LOCAL VARIABLES
      X=EB_VAR(1);Y=EB_VAR(2);Z=EB_VAR(3);U=EB_VAR(4);W=EB_VAR(5)
      ! COMPUTE NONLINEAR FUNCTION USING EMBEDDED ALGEBRA
      EB_FCTN(1) = EXP(U) + X**2*COS(Z)
      EB_FCTN(2) = X*U*(Y*Z)**2
      EB_FCTN(3) = X*Y*Z**2
      EB_FCTN(4) = Z**3/U
      EB_FCTN(5) = Z*SQRT(W)
      EB_FCTN(6) = X*U*ASIN(Y/(U*W))
      EB_FCTN(7) = Z**(1.0D0/3.0D0)*LOG( SQRT(U) )
      ! SORT DATA FOR F(X), JACOBIAN(F), AND HESSIAN(F)
      CALL PARTITION_VECTOR_DATA( EB_FCTN, FX, JAC, HES )
      RETURN
      END SUBROUTINE NONLINEAR_FX

```

**Figure 2: OCEA Nonlinear Vector Function Routine**